TEMS™
CellPlanner

Map Import Wizard User's Guide

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This manual is one of a set of manuals for TEMS LinkPlanner, including these documents:

- TEMS CellPlanner Installation Guide
- TEMS CellPlanner GeoData User's Guide
- TEMS CellPlanner Common Features User's Guide
- TEMS CellPlanner Common Features Technical Reference Manual
- TEMS CellPlanner LTE User's Guide
- TEMS CellPlanner WCDMA User's Guide
- TEMS CellPlanner WCDMA Technical Reference Manual
- TEMS CellPlanner GSM User's Guide
- TEMS CellPlanner GSM Technical Reference Manual
- TEMS CellPlanner WiMAX User's Guide

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1 Introduction

The import wizard is used to create new map databases, or update existing map databases, with external data. It handles all types of map databases described in the ***GeoData User's Guide***, chapter ***TEMS CellPlanner Geodata Concepts and Glossary***, subchapters ***Geobox, MRR and MRV***. MRV databases can however currently not be updated using the Import wizard, to create or update an MRV database you have to use the Preprocess vector data option.

Map data import may be performed using various map file formats, e.g. MID/MIF (MapInfo), SHP (ESRI shape) etc., various map data representation i.e. raster (grid) and vector, and various projections, geodetic datum and units of measure. However, every combination of source/target data is not feasible. The amount of information needed to be entered during the import depends on the selected source; all information may not be available from a map file format etc. The chapter ***Conversion scenarios*** give a presentation on the supported conversions that can be made.

1.1 Supported map database and file formats

1.1.1 Supported map databases

A map database contains enough metadata (information) to be used directly in the TEMS CellPlanner import wizard, e.g. coordinate system, resolution, accuracy etc.

The following map database formats are supported:

- Geobox (internal format, init.grk)
- Planet DMS (EET, old TEMS Cell Planner, Asset)
- Vertical Mapper format/Planet EV (∗.GRD and ∗.GRC)

Note: All other map data formats are treated as map files.

1.1.2 Supported map file formats

A map file format contains some geographical data but not all metadata needed for drawing the contents at the correct position, size etc. All supported file formats are presented in the ***Appendix – GeoData Technical Reference*** of the ***TEMS CellPlanner GeoData Users Guide***.

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1.2 Overview of procedure

The import procedure consists of three steps:

1. Selecting the target database
2. Selecting and setting up definitions for the source data
3. Running the import

By selecting **File -> Map data -> Import wizard** a dialog appears where you get the option to open an existing target map database or to create a new. If you selected an existing database there is a choice to either overwrite its contents or to update the database with the new data. This step is described in chapter ***Selecting target database***.

After selecting the target database, the first window of the Import Wizard is opened. The wizard has three main steps:

- Select source data. Here you can view the source data and also edit and assign coordinate system to image files.
  When clicking **Next**, the validity of the selected source data is controlled before proceeding to the next window.
- Setup data type, map type and coordinate system of the selected source data. The default is fetched from the source data.
- Advanced decisions, e.g. rasterizing parameters or vector main- and subclass assignment.

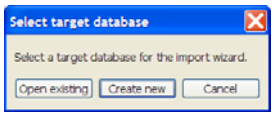
The windows of the import wizard are described in the ***Selecting and setting up source data*** chapter.

Once you have selected and entered all source data, the Import launch dialog will open. This window controls and displays the progress of the import process. The Import launch dialog is described in chapter ***Running the import***.

The ***Examples using different source data formats*** chapter gives further information on how to import map data from the most commonly used formats.

2 Selecting target database

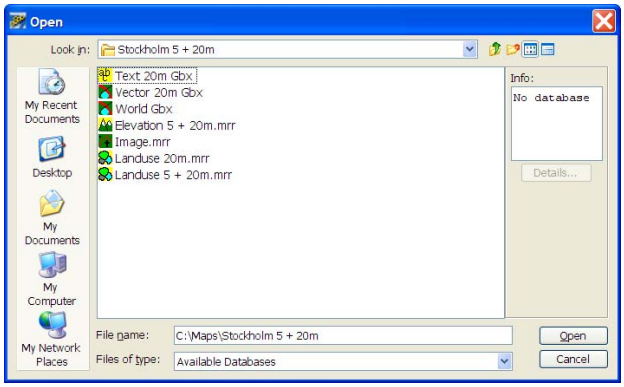
Select **File -> Map data -> Import wizard** to start the import. The first window displays a selection to open an existing map database or to create a new database as target for the import. The **Open** alternative will display a map database chooser, described in chapter ***Map database chooser*** below. The **New** alternative will open the New database window, which is described in the ***New database window*** chapter.



You may select to open an existing database as a target for the import. Before the import starts you will get an option to choose if the new data should replace the existing data or be added to the target.

2.1 Map database chooser

The Map database chooser is used to select an existing map database. The recognized map databases are presented with an icon that corresponds to the map type stored in the database.



2.1.1 Map details window

Select a database and click on the **Details** button to open the **Map details** window. Here you will find information about the database parameters used for the selected map database.

The views can look slightly different depending on the selected database type. The windows below are examples based on an MRR landuse map database with two resolutions, 5m and 20m.

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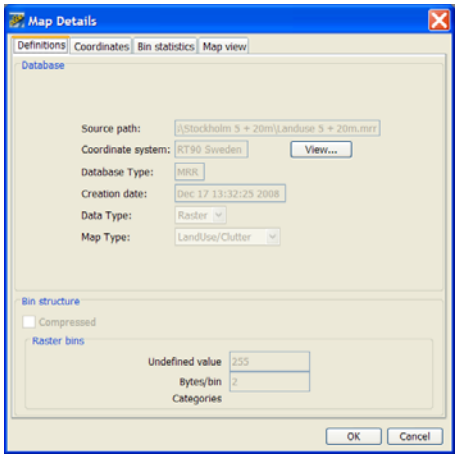
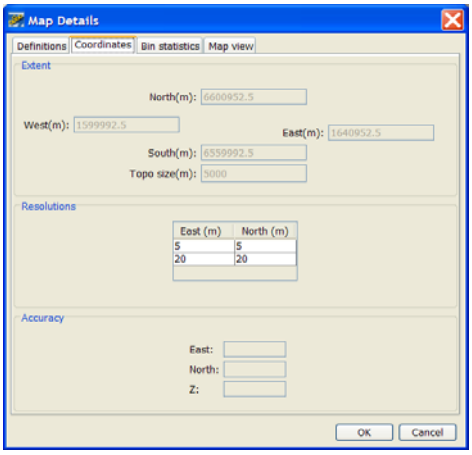
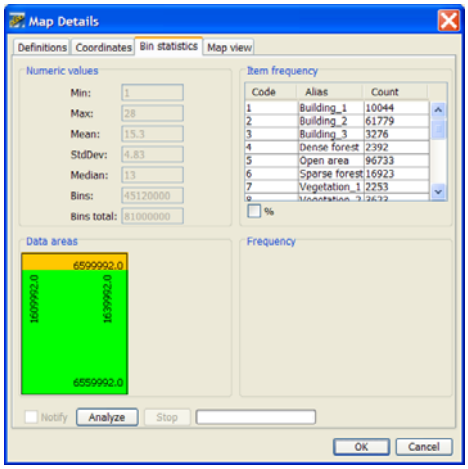
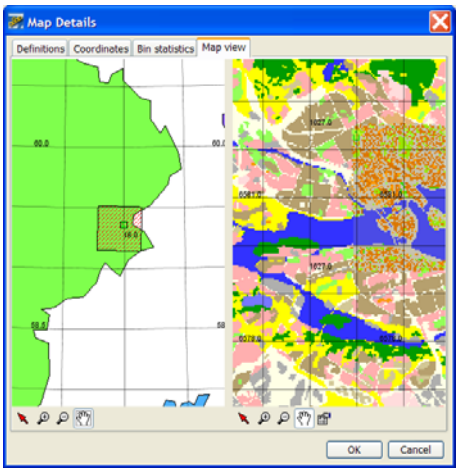








The statistics view is used to analyze the real data by reading all data from the database and perform some simple statistic operations, like calculating minimum, maximum, mean (average), standard deviation and median values for the data.

Click the **Analyze** button to start the statistics analyze. You can stop the analyzing algorithm by clicking the **Stop** button.

The **Data coverage** section displays with colors the amount of actual data coverage, i.e. number of defined bins for raster data and number of objects for vector data. The tool tip at each area displays the respective data coverage.

The Map view displays an overview world map in the left panel and a preview of the map database's contents in the right panel. If you right-click in the map view panels, the Map display properties dialog will be opened. In this dialog you can select how to present the map layers in the view.

2.2 New database window

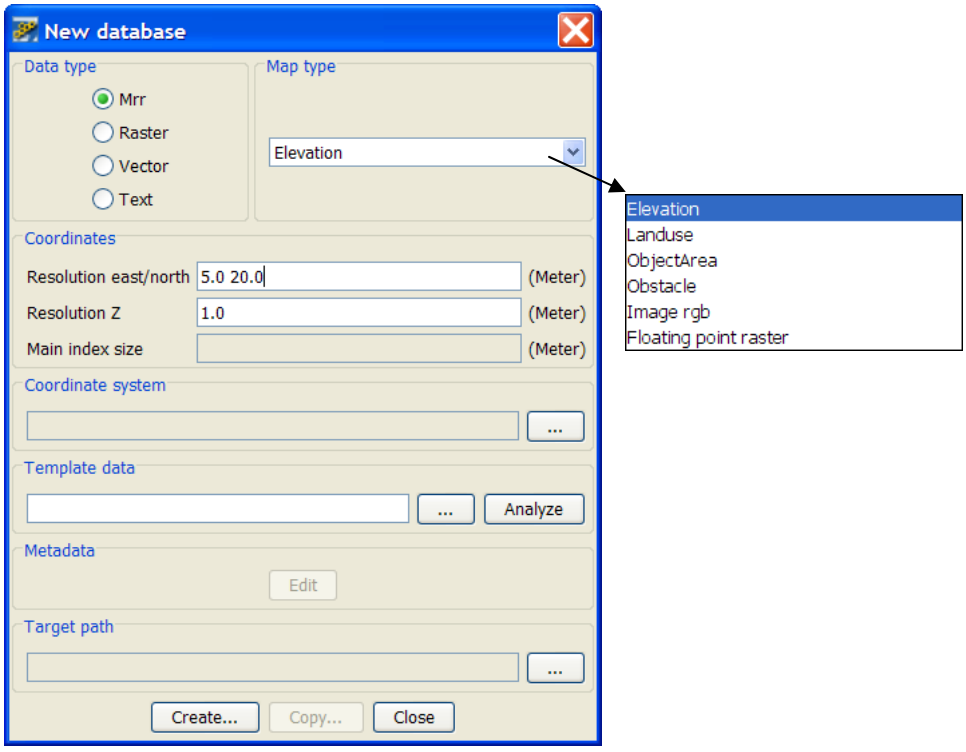
The contents of the New database window changes depending on the target data type, which can be one of the following:

1. MRR – raster data supporting map types: Elevation, Landuse, ObjectArea, Obstacle, Image RGB, Floating point raster
2. Raster – Geobox raster data supporting map types: Elevation, Landuse, ObjectArea, Obstacle, Image index/grey, Floating point raster
3. Vector – Geobox vector data supporting map types: *Vector, Vector 3D, Profiles*
4. Text – Geobox text data supporting map types: *Text (Unicode or ASCII)*

The different window configurations are described in the following chapters.

2.2.1 Window to use for an MRR target

Use the **New database** window with the *Data type* set to **MRR** to create a new MRR database.



2.2.2 Fields on the window for an MRR target

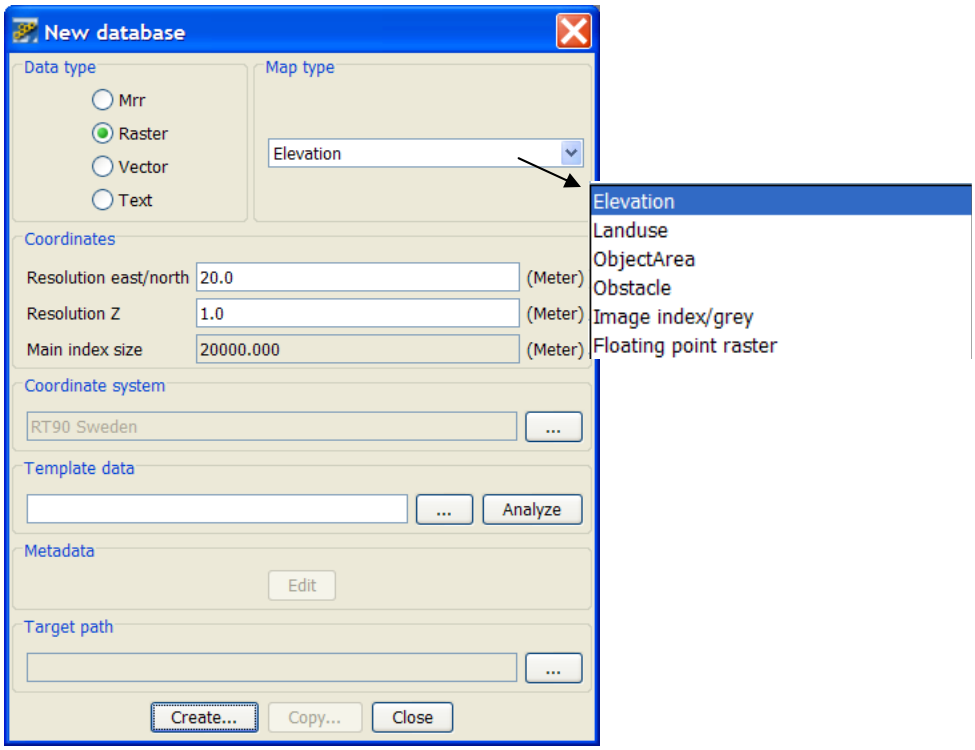
The following table describes the fields on the window for an MRR target:

Field	Description
Data type	The type of map database to create, MRR in this case.
Map type	The different data types can be used to store a variety of map types, this combo box contains the following map types for the MRR data type: • Elevation • Landuse • Object area • Obstacle • Image RGB • Floating point raster The map types are described in the ***TEMS CellPlanner Geodata Concepts and Glossary*** chapter.
Resolution east/north	Defines the length that one side of a pixel corresponds to on the ground. If you want to use multiple resolutions you can enter the desired resolutions separated by a space character, e.g. "*5.0 20.0*".
Resolution Z	Defines the resolution of the value stored in each pixel.
Main index size	Defines the length of one side of each tile stored in the map database. For MRR data this parameter will always be automatically computed.
Coordinate system	Opens the **Map coordinate system selection** dialog where you can select the coordinate system that will be used to store all coordinates in the map database. The window is described in chapter ***Select Coordinate System for Project*** in the ***TEMS CellPlanner Common Features User's Guide***.
Template database	The … button opens a browser allowing you to locate an existing map database that can be used as a template. The parameters of the template file are copied into the window. The **Analyze** button opens a wizard where the most appropriate Resolution and Main index size values can be calculated using the intended source data. In the wizard select source data, conversion method, source coordinate system and conversion attributes. In the final step the Resolution or Main index size that will be optimal for the target database can be calculated by clicking on **Start**. The calculated value can then be copied.
Metadata	Opens a dialog where you can define meta data such as color look up mappings etc. See chapter ***Info file editors*** for more information. The button gets enabled once a *Target path* is defined and if the selected map type requires meta data.

Target path	Opens a browser allowing you to select the path and name for the new map database.
Create	Creates the new map database using the current settings.
Copy	Copies all the data from the template map database into a new database
Close	Closes the window.

2.2.3 Window to use for a Raster target

Use the **New database** window with the *Data type* set to **Raster** to create a new Geobox raster database.



2.2.4 Fields on the window for a Raster target

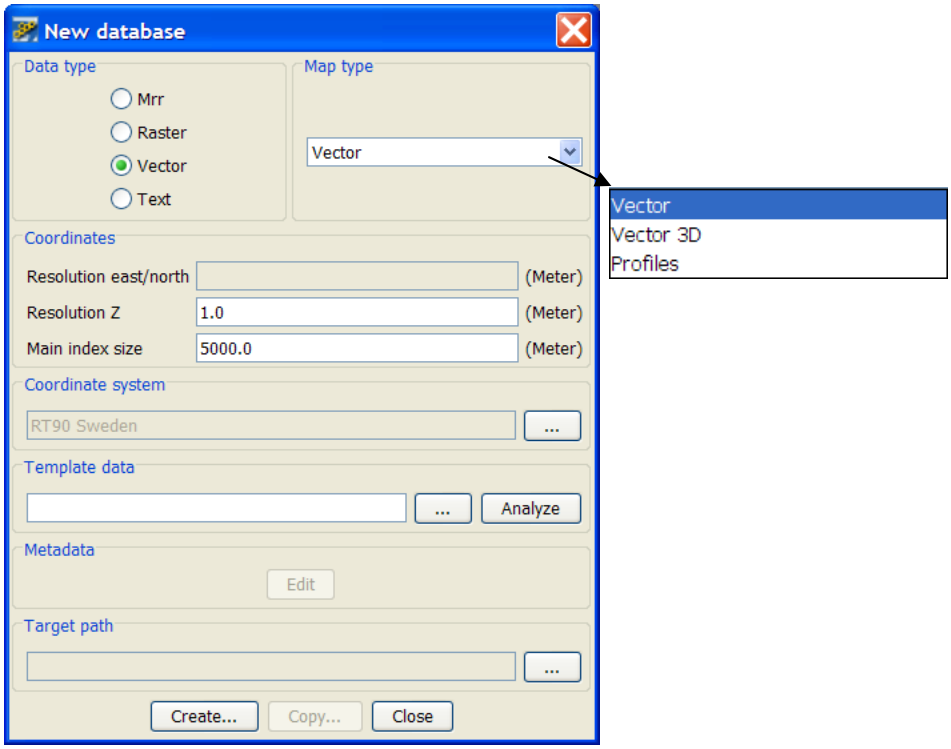
The table below describes the fields on the window for a Geobox raster target:

Field	Description
Data type	The type of map database to create, Raster in this case.
Map type	The different data types can be used to store a variety of map types, this combo box contains the following map types for

	the Raster data type: • Elevation • Landuse • Object area • Obstacle • Image index/grey • Floating point raster The map types are described in the ***TEMS CellPlanner Geodata Concepts and Glossary*** chapter.
Resolution east/north	Defines the length that one side of a pixel corresponds to on the ground.
Resolution Z	Defines the resolution of the value stored in each pixel.
Main index size	Defines the length of one side of each tile stored in the map database. For raster data this parameter will always be 1000*resolution east/north.
Coordinate system	Opens the **Map coordinate system selection** dialog where you can select the coordinate system that will be used to store all coordinates in the map database. The window is described in chapter ***Select Coordinate System for Project*** in the ***TEMS CellPlanner Common Features User's Guide***.
Template database	The … button opens a browser allowing you to locate an existing map database that can be used as a template. The parameters of the template file are copied into the window. The **Analyze** button opens a wizard where the most appropriate Resolution and Main index size values can be calculated using the intended source data. In the wizard select source data, conversion method, source coordinate system and conversion attributes. In the final step the Resolution or Main index size that will be optimal for the target database can be calculated by clicking on Start. The calculated value can then be copied.
Metadata	Opens a dialog where you can define meta data such as color look up mappings etc. See chapter ***Info file editors*** for more information. The button gets enabled once a *Target path* is defined and if the selected map type requires meta data.
Target path	Opens a browser allowing you to select the path and name for the new map database.
Create	Creates the new map database using the current settings.
Copy	Copies all the data from the template map database into a new database
Close	Closes the window.

2.2.5 Window to use for a Vector target

Use the **New database** window with the *Data type* set to **Vector** to create a new Geobox vector database.



2.2.6 Fields on the window for a Vector target

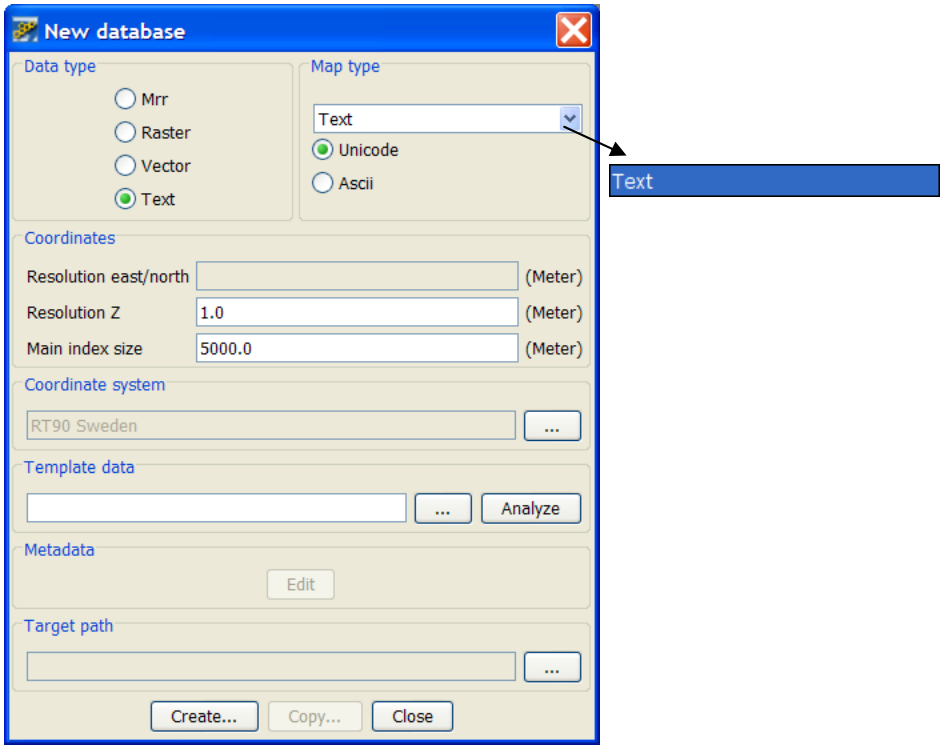
The table below describes the fields on the window for a Geobox vector target:

Field	Description
Data type	The type of map database to create, Vector in this case.
Map type	The different data types can be used to store a variety of map types, this combo box contains the following map types for the Vector data type: • Vector • Vector 3D • Profiles The map types are described in the ***TEMS CellPlanner Geodata Concepts and Glossary*** chapter
Resolution east/north	Defines the length that one side of a pixel corresponds to on the ground. Not applicable for vector data.
Resolution Z	Defines the resolution of the value stored in each point.

Main index size	Defines the length of one side of each tile stored in the map database. For vector data this parameter should be set to a value that will store between 1000 and 10.000 objects in each tile. Too many or too few gives low performance when reading from the map database. The Analyze button can be used to calculate an appropriate value.
Coordinate system	Opens the **Map coordinate system selection** dialog where you can select the coordinate system that will be used to store all coordinates in the map database. The window is described in chapter ***Select Coordinate System for Project*** in the ***TEMS CellPlanner Common Features User's Guide***.
Template database	The … button opens a browser allowing you to locate an existing map database that can be used as a template. The parameters of the template file are copied into the window. The **Analyze** button opens a wizard where the most appropriate Resolution and Main index size values can be calculated using the intended source data. In the wizard select source data, conversion method, source coordinate system and conversion attributes. In the final step the Resolution or Main index size that will be optimal for the target database can be calculated by clicking on **Start**. The calculated value can then be copied.
Metadata	Opens a dialog where you can define meta data such as color and line styles etc. for each vector class stored. The button gets enabled once a *Target path* is defined. See chapter ***Info file editors*** for more information.
Target path	Opens a browser allowing you to select the path and name for the new map database.
Create	Creates the new map database using the current settings.
Copy	Copies all the data from the template map database into a new database
Close	Closes the window.

2.2.7 Window to use for a Text target

Use the **New database** window with the *Data type* set to **Text** to create a new Geobox text database.



2.2.8 Fields on the window for a Text target

The table below describes the fields on the window for a Geobox text target:

Field	Description
Data type	The type of map database to create, Text in this case.
Map type	The different data types can be used to store a variety of map types, this combo box contains the following map types for the Text data type: • Text The two radio buttons are used to define the format of the text data. • Unicode • ASCII The map types are described in the ***TEMS CellPlanner Geodata Concepts and Glossary*** chapter
Resolution east/north	Defines the length that one side of a pixel corresponds to on the ground. Not applicable for text data.

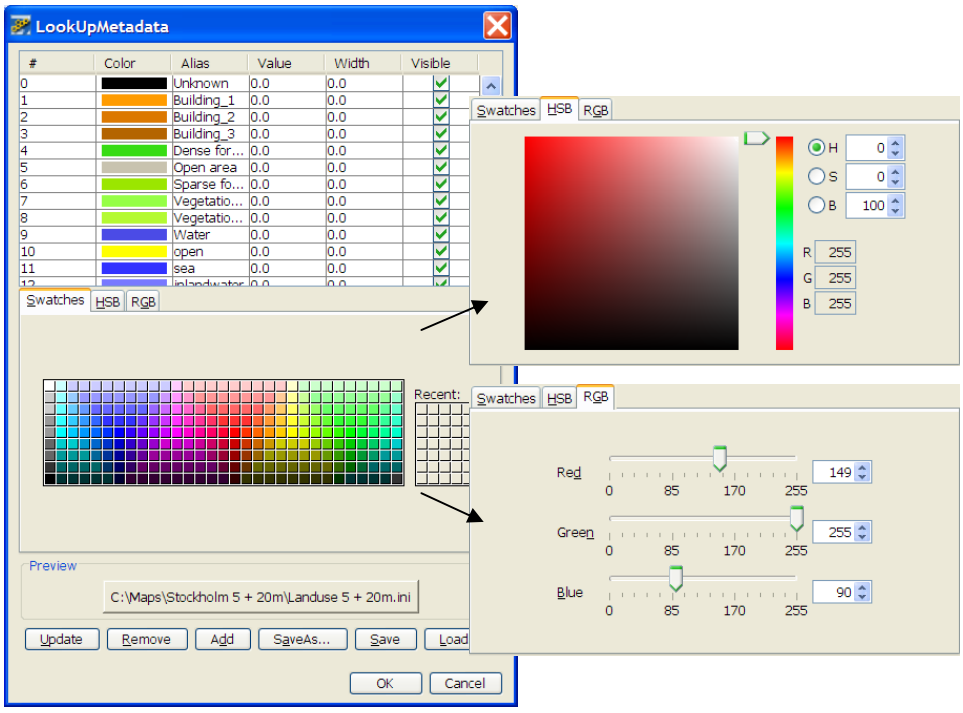
Resolution Z	Defines the resolution of the value stored in each pixel.
Main index size	Defines the length of one side of each tile stored in the map database. For vector data this parameter should be set to a value that will store between 1000 and 10.000 objects in each tile. Too many or too few gives low performance when reading from the map database. The **Analyze** button can be used to calculate an appropriate value.
Coordinate system	Opens the **Map coordinate system selection** dialog where you can select the coordinate system that will be used to store all coordinates in the map database. The window is described in chapter ***Select Coordinate System for Project*** in the ***TEMS CellPlanner Common Features User's Guide***.
Template database	The … button opens a browser allowing you to locate an existing map database that can be used as a template. The parameters of the template file are copied into the window. The **Analyze** button opens a wizard where the most appropriate Resolution and Main index size values can be calculated using the intended source data. In the wizard select source data, conversion method, source coordinate system and conversion attributes. In the final step the Resolution or Main index size that will be optimal for the target database can be calculated by clicking on **Start**. The calculated value can then be copied.
Metadata	Opens a dialog where you can define meta data such as color and fonts etc. for each class in the database. The button gets enabled once a *Target path* is defined. See **chapter *Info file editors*** for more information.
Target path	Opens a browser allowing you to select the path and name for the new map database.
Create	Creates the new map database using the current settings.
Copy	Copies all the data from the template map database into a new database
Close	Closes the window.

2.3 Info file editors

Information files are used to define how to present the map data when it is displayed. Colors, line and font styles etc. are defined in the info files. Info files must be created for the **Landuse**, **Vector** and **Text** map types. No map database of these types will be displayed without an info file.

2.3.1 Landuse info editor

Use the Landuse info editor to define how the different landuse codes should be presented when displayed.

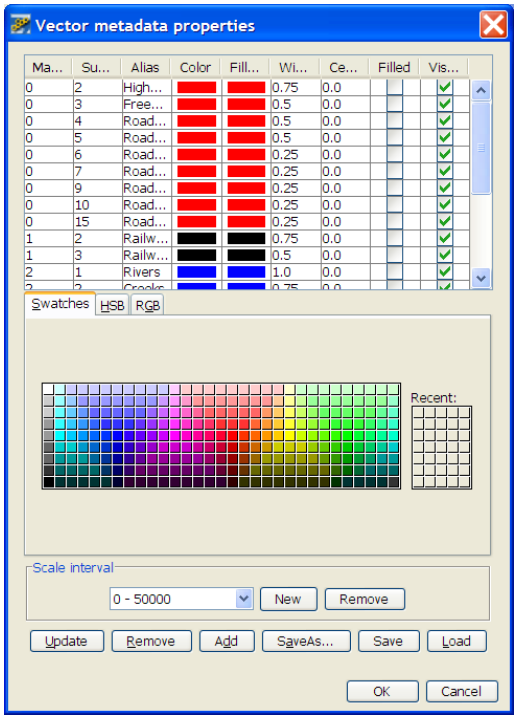


Field	Description
Contents table	The content of the landuse information file is displayed in the table: # = Code value **Color** = Preferred display color **Alias** = Code description shown in e.g. map legend **Value** = Associated numeric value, i.e. default height **Width** = Associated line width if the code was extracted from 1 dimensional objects **Visible**= True if pixels with this code should be visible You can modify individual fields by selecting the cell and edit it. The color field is edited by using the color panel.
Color panel	Provides color selection using three different methods: • Predefined color swatches • Hue, Saturation and Brightness

	• Red, Green and Blue You can select the method you prefer to edit the color of the selected landuse code.
Update	Updates the contents from the actual data stored in the map database. The content of the database is analyzed and the result presented in the contents table. Landuse codes defined in the table that do not exist in the database will be removed. Landuse codes that exist in the database but not in the table will be added using auto-generated alias and color values.
Remove	Removes the selected row (or rows).
Add	Adds an empty row for editing.
Save as	Opens a file chooser dialog to specify the path and file name where to save the contents to a landuse info file.
Save	Saves the contents in the current landuse info file.
Load	Opens a file chooser where an existing landuse info file can be selected and opened in this editor.
OK	Closes the dialog and saves the current configuration.
Cancel	Closes the dialog.

2.3.2 Vector info editor

Use the Vector info editor to define how the different vector main and sub classes should be presented when displayed. The display settings can be set individually for different scale intervals.



Field	Description
Contents table	The content of the vector information file for the selected scale interval is displayed in the table: **Main Class** = Vector data main class **Sub Class** = Vector data sub class **Alias** = description shown in e.g. map legend **Color** = Preferred draw color for 1-dimensional objects and outlines **Fill Color** = Preferred fill color for 2-dimensional objects **Width** = Preferred line width in mm **Centre Line** = Preferred line width in mm of a centre line when drawing dual color lines **Filled** = True if the object type should be filled, i.e. if it is 2- dimensional **Visible** = True if objects with this classification should be visible You can modify individual fields by selecting the cell and edit it. The color fields are edited by using the color panel.
Color panel	Provides color selection using three different methods: • Predefined color swatches • Hue, Saturation and Brightness • Red, Green and Blue You can select the method you prefer to edit the color of the selected main and sub class combination.
Scale interval	For best performance, and readability, the presentation of different main and sub class combinations can be set up with different values for different scale intervals. You can add and remove scale intervals as appropriate.
Update	Updates the contents from the actual data stored in the map database. The content of the database is analyzed and the result presented in the contents table. Main and sub class combinations defined in the table that do not exist in the database will be removed. Main and sub class combinations that exist in the database but not in the table will be added using auto-generated alias and color values.
Remove	Removes the selected row (or rows).
Add	Adds an empty row for editing.
Save as	Opens a file chooser dialog to specify the path and file name where to save the contents to a vector info file.
Save	Saves the contents in the current vector info file.
Load	Opens a file chooser where an existing vector info file can be selected and opened in this editor.
OK	Closes the dialog and saves the current configuration.
Cancel	Closes the dialog.

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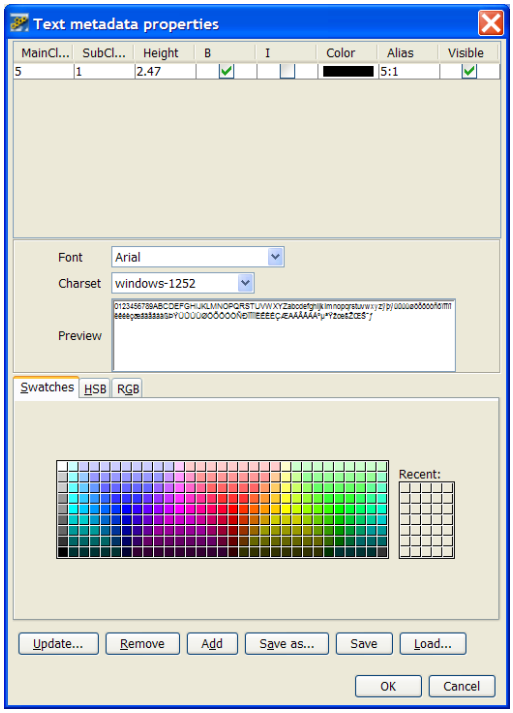
2.3.3 Text info editor

Use the Text info editor to define how the different text main and sub classes should be presented when displayed.



Field	Description
Contents table	The content of the text information file for the selected scale interval is displayed in the table: **Main Class** = Text data main class **Sub Class** = Text data sub class **Height** = Preferred text height in mm **B** = True if the text should be bold **I** = True if the text should be italic **Color** = Preferred text color **Alias** = description shown in e.g. map legend **Visible** = True if objects with this classification should be visible You can modify individual fields by selecting the cell and edit it. The color field is edited by using the color panel.
Font panel	Select the font to be used by all texts.
Color panel	Provides color selection using three different methods: • Predefined color swatches • Hue, Saturation and Brightness

	• Red, Green and Blue You can select the method you prefer to edit the color of the selected main and sub class combination.
Update	Updates the contents from the actual data stored in the map database. The content of the database is analyzed and the result presented in the contents table. Main and sub class combinations defined in the table that do not exist in the database will be removed. Main and sub class combinations that exist in the database but not in the table will be added using auto-generated alias and color values.
Remove	Removes the selected row (or rows).
Add	Adds an empty row for editing.
Save as	Opens a file chooser dialog to specify the path and file name where to save the contents to a text info file.
Save	Saves the contents in the current text info file.
Load	Opens a file chooser where an existing text info file can be selected and opened in this editor.
OK	Closes the dialog and saves the current configuration.
Cancel	Closes the dialog.

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3 Selecting and setting up source data

Once the target database is selected, as described in the previous chapter, the Import Wizard dialog will open.

Note: Each parameter in the wizard refers to source data only. The target database and its parameters is already selected prior to opening the wizard.

Depending on the combination of source and target data, the windows displayed in the wizard may differ.

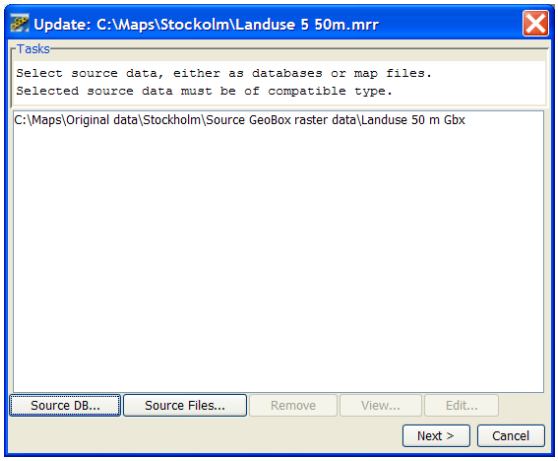
3.1 Windows to use for selecting source data

Independent of what target database and source type combination that is selected, the three first windows are common.

3.1.1 Source selection window

The first window of the Import Wizard is used to select the source data for the import. Several sources may be selected, but there are some limitations:

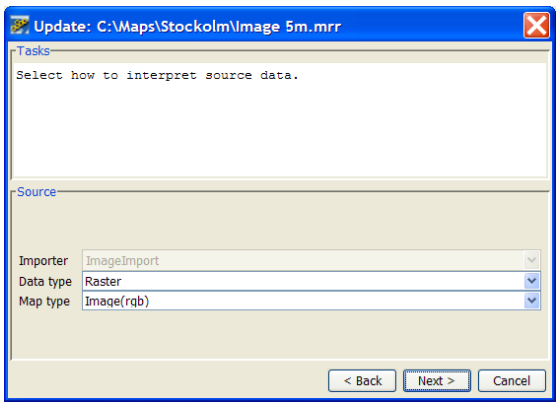
- **MRR target**; if the target is defined with multiple resolutions, source data with different resolutions should be imported separately. The sources with the coarsest resolution should be imported first, followed by the sources with finer resolution.
- **Vector target**; all sources selected should be of the same format, have the same coordinate system, and share the same main class (e.g. *Roads*) and attribute definitions. Other formats, main classes etc., can be added in subsequent imports.
- **Text target**; all sources selected should be of the same format, have the same coordinate system, and share the same main class (e.g. *Water*) and attribute definitions. Other formats, main classes etc., can be added in subsequent imports.



Field	Description
Tasks	Field that contain instructions for the different steps of the map import wizard.
Source list	The list shows the selected sources that will be imported. If you right-click on a source you will get a pop-up menu with two choices: • **View**; opens the **Map details** window where you can preview the selected source • **Edit**; this is a special feature for image files. See the Edit… field below.
Source DB	Opens a **Map Database Chooser**.
Source Files	Opens a **File Chooser**. You can select one or several files of known format, see more in chapter ***Supported map database and file formats***.
Remove	Removes the selected row (or rows) from the list.
View…	Opens **the Map details** window for the selected source.
Edit…	Opens **the Image File Registration** window in which it is possible to assign a coordinate system to an image via an affine transformation. See **the *Image File Registration Tool*** chapter on how to use this window. This option is only enabled for image files.
Next	Opens the next window of the import wizard.
Cancel	Closes the import wizard.

3.1.2 Source type definition window

The wizard tries to find a suitable module for import and classification of source data. Depending on the selected source and target data combination, the different fields may be editable or not.



Field	Description
Tasks	Field that contain instructions for the different steps of the map import wizard.

Importer	The wizard tries to find a suitable module for import for the selected source data. In some cases you may select other alternatives.
Data type	The wizard tries to find the correct data type for the source data. In some cases you may select other alternatives. The selectable data types are: • Raster • Vector • Text • Undefined The data types are described in the ***TEMS CellPlanner Geodata Concepts and Glossary*** chapter.
Map type	The wizard tries to find the correct map type for the source data. In some cases you may select other alternatives. The selectable map types are: • Elevation • Image • Image RGB • Landuse • Object area • Obstacle • Tele traffic • Text • Vector • Undefined The map types are described in the ***TEMS CellPlanner Geodata Concepts and Glossary*** chapter.
Back	Opens the previous window of the import wizard.
Next	Opens the next window of the import wizard.
Cancel	Closes the import wizard.

3.1.3 Source map reference system window

If the source data has a capability to handle coordinate systems, its system will be displayed. If the coordinate system of the source data can not be automatically retrieved you have to select the correct reference system in the **Map coordinate system selection** dialog.

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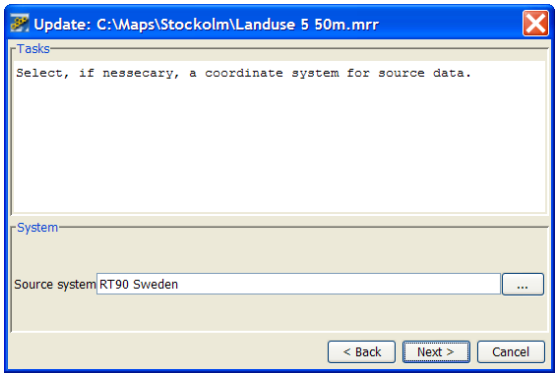
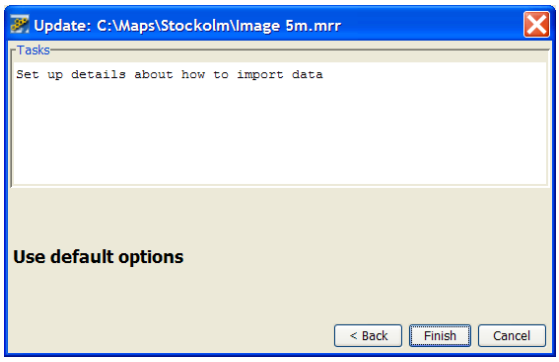


Field	Description
Tasks	Field that contain instructions for the different steps of the map import wizard.
Source system	Opens the **Map coordinate system selection** dialog.
Back	Opens the previous window of the import wizard.
Next	Opens the next window of the import wizard.
Cancel	Closes the import wizard.

3.2 Default options window

When all information needed to perform the import is already defined in the previous steps, and by the source data itself, the Default option window will be displayed. You can simply press **Finish** to open the Import launch dialog, which is described in chapter ***Running the import***.



Field	Description
Tasks	Field that contain instructions for the different steps of the map import wizard.
Back	Opens the previous window of the import wizard.
Finish	Opens the Import launch dialog.
Cancel	Closes the import wizard.

3.3 Windows to use for raster to raster data

The following windows are displayed when importing raster source data to one of the raster target databases. Depending on the map type of the selected target, different windows will be displayed.

3.3.1 Landuse code definition windows

The **Code mismatch** window is displayed if the source data contains landuse codes that have not been defined in the target database's information file. In this window you can select how to handle the codes found in the source data. The window will be repeated until all codes found in the source data are handled.

Field	Description
Code presentation	This label presents the found code, alias and value.
Apply	Add this code and value to the target's info file.
Apply All	Add all remaining source codes to the target's info file.
Discard	Discard this code.
Discard All	Discard all remaining source codes.

The **Code mapping** window is displayed once all landuse codes found in the source data have been added to the target's information file, or discarded. It gives you a possibility to verify what codes that will be imported, and also to change to what target code the different source codes should be mapped.

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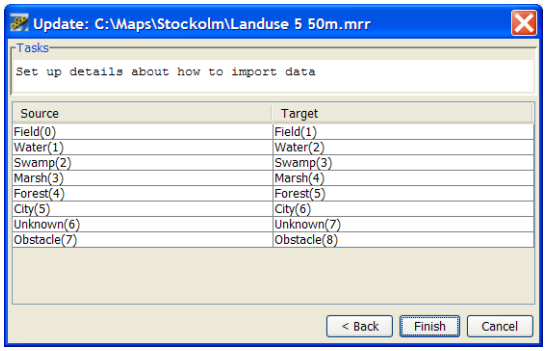


Field	Description
Tasks	Field that contain instructions for the different steps of the map import wizard.
Code mapping table	Contains the source to target landuse code mappings. You can change the mapping for each specific source code by clicking on the target cell to get a combo box that contains all codes defined in the target's info file. Select one of the codes in the combo box to make a new mapping.
Back	Opens the previous window of the import wizard.
Finish	Opens the Import launch dialog.
Cancel	Closes the import wizard.

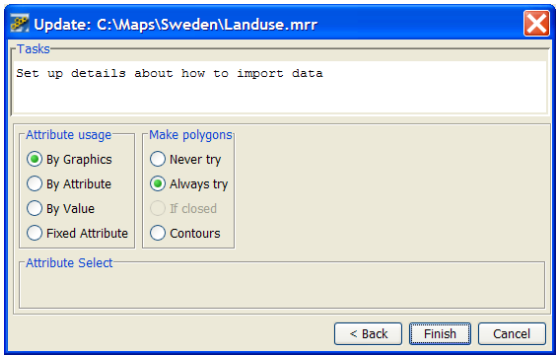
3.4 Window to use for vector to raster data

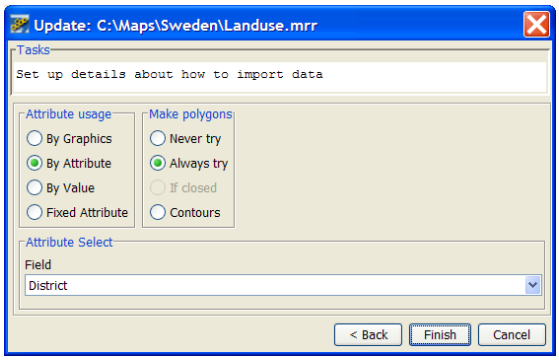
The following window is displayed when importing vector source data to one of the raster target databases, e.g. vector contours to elevation or vector polygons to landuse.

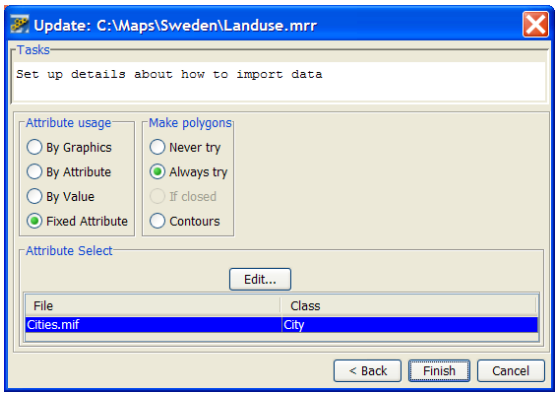
Since the target is raster there are several possibilities how the source objects geometry may be interpreted, points, poly lines or polygons. Depending on the target map type there are some limitations to consider:

- **Vector files to Landuse/Traffic**: It is assumed that the source data contains polygons with some kind of attributes. The **Contours** option is not relevant for this combination.
- Vector files to Obstacle/Object areas: Only the By value option is relevant.
- **Vector files to Elevation**: Only the **By value** option is relevant and the **Make polygons** option should be **Contours**.

Depending on the selected **Attribute usage** method, the **Attribute Select** panel will have different contents.







Field	Description
Tasks	Field that contain instructions for the different steps of the map import wizard.
Attribute usage	There are four options for how to retrieve the attribute of each object: • **By Graphics**: It is assumed that each source object has a set of graphic attributes, such as color, line width etc. Each unique set of graphic attributes in the source file results in a unique code, automatically calculated during the following import session. • **By Attribute**: It is assumed that each object has one or several string attribute(s) that may be used for coding. Each unique string attribute will result in a unique code, automatically calculated during the following import session. You have to select the

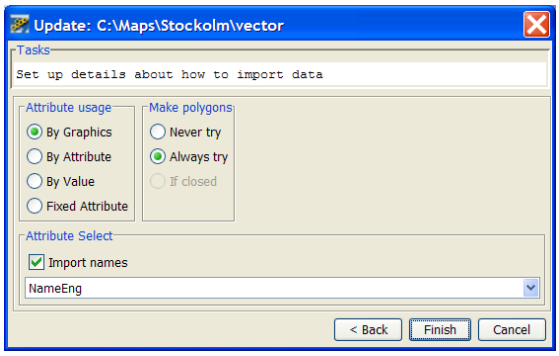
	desired attribute field from the source file structure; see the *Attribute select* field below. Although it is not checked here, all files imported in the same batch, must have exactly the same structure in order to make the import complete. • **By Value**: It is assumed that each object has at least one string attribute that may be parsed into a number, integer or floating point. This attribute will be parsed to an integer during the following import session. You have to select the desired attribute field from the source file structure; see the *Attribute select* field below. Although it is not checked here, all files imported in the same batch, must have exactly the same structure in order to make the import complete. • **Fixed Attribute**: For each source, you should select an attribute using the list of attributes from the target database's metadata. This requires that the target metadata exists. You can add more metadata entries by clicking the **Edit** button, thus invoking the **Vector info editor**. Although the target data is raster, a temporary vector database is utilized so, unfortunately, you will have to add the metadata entry with both main and sub class. **Note:** **- The main class should always be set to 20.** **- The sub class should be set to the desired code value**.
Make polygons	There are four options for how to handle the vector data so that the correct rasterization method will be used during the following import session: • **Never try**: Never tries to close objects to polygons, just treats them as 1-dimensional objects. • **If closed**: If the first and last points in an object coincide, the object is treated as a polygon (2-dimensional object). • **Always try**: Assumes that all objects are polygons, adds the first point to end of poly line if necessary. • **Contours**: Assumes that all objects are contour lines, i.e. a line that represents a constant elevation.
Attribute select	If you have selected the *By attribute* or *By value* option in the Attribute usage panel, the following contents will be displayed: • **Field**: You can select from the combo box what field that shall be used to separate between different features (e.g. landuse codes) in the source data. If you have selected the *Fixed attribute* option, the following contents will be displayed: • **Edit**: Opens the Vector info editor where you can add new codes to the target's information file. • **Code mapping table**: The table displays the code that is mapped to each source. You can change a mapping by clicking on the cells in the *Class* column and select a class from the combo box.
Back	Opens the previous window of the import wizard.
Finish	Opens the Import launch dialog.

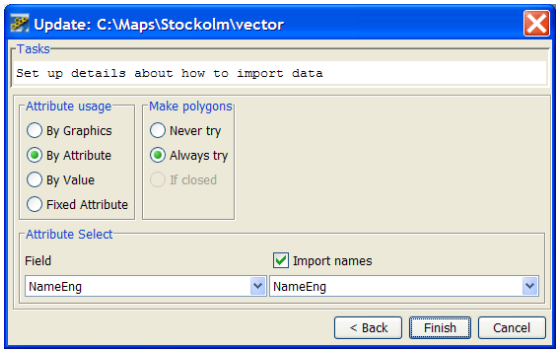
Cancel	Closes the import wizard.

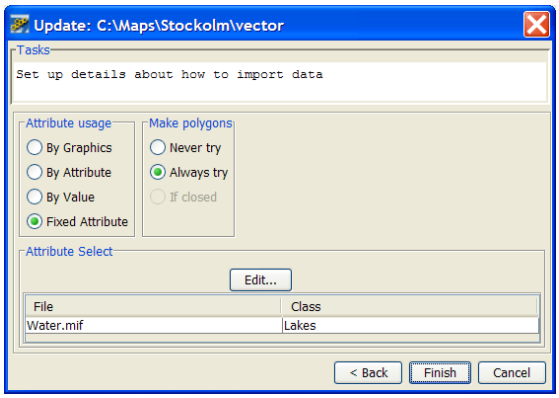
3.5 Windows to use for vector to vector data

The following window is displayed when importing vector source data to a vector target database.

Depending on the selected **Attribute usage** method, the **Attribute Select** panel will have different contents.





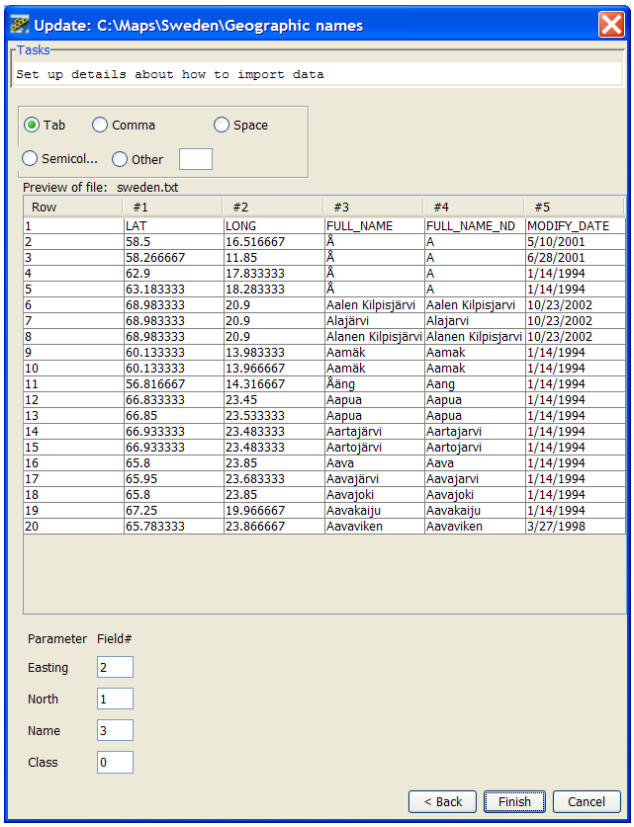


Field	Description
Tasks	Field that contain instructions for the different steps of the map import wizard.
Attribute usage	There are four options for how to retrieve the attribute of each object: • **By Graphics**: It is assumed that each source object has a set of graphic attributes, such as color, line width etc. Each unique set of graphic attributes in the source file results in a unique code, automatically calculated during the following import session. • By Attribute: It is assumed that each object has one or several string attribute(s) that may be used for coding. Each unique string attribute will result in a unique code, automatically calculated during the following import session. You will have to select the desired attribute field from the source file structure; see the *Attribute select* field below. Although it is not checked here, all files imported in the same batch must have exactly the same structure in order to make the import complete. • **By Value**: It is assumed that each object has at least one string attribute that may be parsed into a number, integer or floating point. This attribute will be parsed to an integer during the following import session. You will have to select the desired attribute field from the source file structure; see the *Attribute select* field below. Although it is not checked here, all files imported in the same batch must have exactly the same structure in order to make the import complete. • **Fixed Attribute**: For each file you will have to select an attribute via a list of attributes from the target database's metadata. This requires that the target metadata exists. It is possible to add more metadata entries by clicking the Edit button, thus invoking the Vector metadata editor.
Make polygons	Since the target is vector the objects' geometry will not be modified. Thus the **Make polygons** options are obsolete here. There are three options for how to handle the vector data: • **Never try**: Never try to close objects to polygons, just treat them as 1-dimensional objects. • **Always try**: Assume that all objects are polygons, adds the first point to end of poly line if necessary. • **If closed**: If first and last point in an object coincides it is treated as a polygon, 2-dimensional object.
Attribute select	If you have selected the *By graphics* option in the Attribute usage panel, the following contents will be displayed: Import names: Select true if you want to import aliases. • **Source attribute**: You can select from what field the alias shall be read. If you have selected the *By attribute* or *By value* option in the Attribute usage panel, the following contents will also be

	displayed: • **Field**: You can select from the combo box what field that shall be used to separate between different features (e.g. different road categories) in the source data. If you have selected the *Fixed attribute* option, the following contents will be displayed: • **Edit**: Opens the **Vector info editor** where you can add new entries to the target's information file. • **Code mapping table**: The table displays the code that is mapped to each source. You can change a mapping by clicking on the cells in the Class column and select a class from the combo box.
Back	Opens the previous window of the import wizard.
Finish	Opens the Import launch dialog.
Cancel	Closes the import wizard.

3.6 Windows to use for text table file data

The following window is displayed when importing text table file source data to a text target database. Only one file should be imported at a time.


Update: C:\Maps\Sweden\Geographic names
Tasks
Set up details about how to import data
Tab
Comma
Space
Semicol...
Other
Preview of file: sweden.txt
Row #1 #2 #3 #4 #5
1 LAT LONG FULL_NAME FULL_NAME_ND MODIFY_DATE
2 58.5 16.516667 Å A 5/10/2001
3 58.266667 11.85 Å A 6/28/2001
4 62.9 17.833333 Å A 1/14/1994
5 63.183333 18.283333 Å A 1/14/1994
6 68.983333 20.9 Aalen Kilpisjärvi Aalen Kilpisjarvi 10/23/2002
7 68.983333 20.9 Alajärvi Alajarvi 10/23/2002
8 68.983333 20.9 Alanen Kilpisjärvi Alanen Kilpisjarvi 10/23/2002
9 60.133333 13.983333 Aamäk Aamak 1/14/1994
10 60.133333 13.966667 Aamäk Aamak 1/14/1994
11 56.816667 14.316667 Ääng Aang 1/14/1994
12 66.833333 23.45 Aapua Aapua 1/14/1994
13 66.85 23.533333 Aapua Aapua 1/14/1994
14 66.933333 23.483333 Aartajärvi Aartajarvi 1/14/1994
15 66.933333 23.483333 Aartojärvi Aartojarvi 1/14/1994
16 65.8 23.85 Aava Aava 1/14/1994
17 65.95 23.683333 Aavajärvi Aavajarvi 1/14/1994
18 65.8 23.85 Aavajoki Aavajoki 1/14/1994
19 67.25 19.966667 Aavakaiju Aavakaiju 1/14/1994
20 65.783333 23.866667 Aavaviken Aavaviken 3/27/1998
Parameter Field#
Easting 2
North 1
Name 3
Class 0
< Back
Finish
Cancel

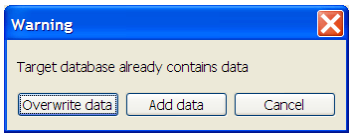
Field	Description
Tasks	Field that contain instructions for the different steps of the map import wizard.
Delimiter panel	Define what delimiter that is used in the source file. The *Preview table* updates when you change the setting.
Preview table	Displays the first 20 rows in the source file using the current encoding and delimiter settings.
Easting	Define what column that contains the easting (or longitude) coordinates. The interpretation of the coordinates is based on the selected source map reference system.
Northing	Define what column that contains the northing (or latitude) coordinates.
Name	Define what column that contains the text data that shall be imported.
Class	The *Main class* that shall be used for the contents of the selected source data.
Back	Opens the previous window of the import wizard.
Finish	Opens the Import launch dialog.
Cancel	Closes the import wizard.

4 Running the import

4.1 Window to use for running the import

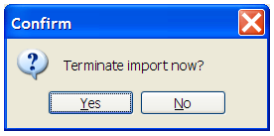
The Import launch dialog allows you to start the actual import process and to view the progress. By selecting **Start** the process will begin.

If you have selected an existing target database there will be an input dialog shown where you can decide if the source data should replace any existing contents, or if it should be added to the existing target database.

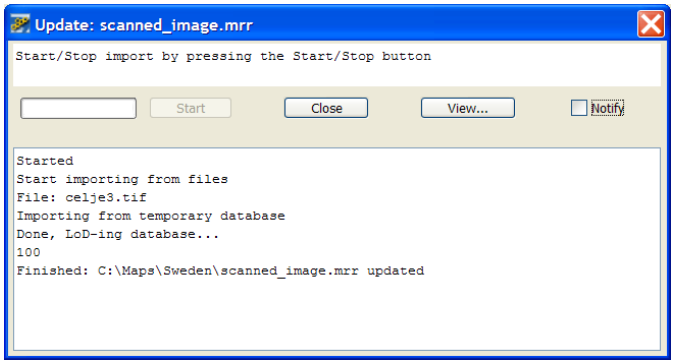


Once the import has started the dialog will show the progress in a progress bar and the **Start** button is renamed to **Stop**.

You can abort the import process by selecting **Stop**. A confirmation dialog will be shown before the process is terminated.



Once the import has finished, the Start and Stop button will again be renamed to **Start** and disabled. A *Finished* message will be displayed in the message panel.



4.1.1 Fields on the Import launch dialog

The following table describes the fields on the Import launch dialog:

Field	Description
Progress bar	Shows the current progress
Start / Stop	Starts or stops the import process. The button is renamed depending on if the import is running or not.
Close	Closes the window. While the import process is running this button is disabled.
View…	Opens the **Map details** window for the target.
Notify	You can select to be notified by e.g. SMS or e-mail once the import process is finished. The notification is configured in **File->Map data->Notification settings….** As the import can be very time consuming, this can be a useful feature.
Message panel	Shows messages during the import process about the current status.

5 Conversion scenarios

Some typical conversion scenarios are described below. Based on the respective target database type, the source data types that can be used are presented. The information that you will need to enter manually is also included in the tables.

5.1 Elevation

Elevation is a raster with 2-bytes per pixel representing the surface height above mean sea level (AMSL), i.e. it is a quantitative raster.

Elevation data may be updated from both raster and vector data, from both databases and map files.

Source data	User interactions	Conversion method
Elevation database	None	-
Obstacle database	None	-
Landuse database	None	Using the landuse default height
Elevation raster files	Select coordinate system and z-unit	-
Vector database	Select conversion method	Elevation contours to raster or points to raster conversion.
Vector files	- Select coordinate system and z-unit. - Select data field for z-value. - Select conversion method.	Elevation contours to raster or points to raster conversion.

5.2 Obstacle

Obstacle or Buildings is a raster with 2 bytes per pixel representing obstacle height above ground level (AGL), i.e. a quantitative raster.

Source data	User interactions	Conversion method
Elevation database	None	-
Obstacle database	None	-
Landuse database	None	Using the landuse default height
Elevation raster files	Select coordinate system and z-unit	-
Vector database	None	Polygons (buildings) to raster conversion.
Vector files	- Select coordinate system and z-unit. - Select data field for z-value.	Polygons (buildings) to raster conversion.

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5.3 Landuse

Landuse, sometimes referred to as Clutter, is a raster with 2 bytes per pixel representing a landuse code, i.e. a qualitative raster. The converter will automatically try to keep the codes between 0-254 (keeping code 255 for undefined).

Source data	User interactions	Conversion method
Elevation database	Select z-intervals	Classification by interval
Obstacle database	Select z-intervals	Classification by interval
Landuse database	None	Reclassification if needed
Landuse raster files	Assign an alias for each raster value	Reclassification
Vector database	Assign an alias for each class	Reclassification + polygon to raster conversion.
Vector files	- Select coordinate system. - Select data field for code.	Reclassification + polygon to raster conversion.

5.4 Traffic

Traffic classification is a raster with 1 or 2 bytes per pixel representing a classification code for traffic density, a qualitative raster. The conversion capabilities are the same as for Landuse.

5.5 Vector

Vector data is used for reference display only, to make it easier to locate yourself in the map view.

Source data	User interactions	Conversion method
Vector database	Assign a target class for each source class.	Reclassification
Vector files	- Select coordinate system. - Select data field for classification. - Assign a target class for each source class.	Reclassification.

5.6 Text

Text data is used for reference display only, to make it easier to locate yourself in the map view.

Source data	User interactions	Conversion method
Text database	Assign a target class for each source class.	Reclassification
Vector files	- Select coordinate system. - Select data field for classification. - Assign a target class for each source class. - Select encoding type (character set).	Reclassification.
Text files	- Select coordinate system. - Select column separator(s). - Select columns for easting, northing and text value.	-

5.7 Image

Image, or Raster, is a raster with 1 to 4 bytes per pixel, indexed or RGB/RGBA representing a color.

Source data	User interactions	Conversion method
Image database	None	Reclassification
Image files including TFW or TAB	None	Reclassification

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6 Examples using different source data formats

6.1 Planet format (DMS / Unix version)

The format is described in the ***Map data format descriptions*** chapter.

To import the Planet (TCP) format the data must be stored according to the Planet format specification. The following things are of most importance:

- The folders that are selected as source database (Planet) must have the following names; Heights, Clutter, Vector, Text, Buildings and Backdrops. If for example *heights 100m* or *elevation* is used, it will not be possible to import without renaming the folders. Folders with Geobox map data can have any name.
- Different resolutions cannot be mixed in the Planet format. Files with different resolutions must be divided into separate folders. The index file must be copied into each folder and all unnecessary information should be removed (leave only the rows with files with the corresponding resolution). The folders with different resolution must then be converted one by one.
- The map data reference system for the map data must be known. Information can be found in the projection file and/or in a text document that has been provided by the map data supplier.

6.1.1 Procedure for an elevation conversion

Do as follows to convert elevation data:

1. Select **File -> Map data -> Import wizard** and the **New** alternative to create a new database. Select the Planet height database as template database. The resolution will then be filled in automatically. The proper map coordinate system may be selected again after selecting the template database.
2. Click **Target path** and give the new elevation database a name.

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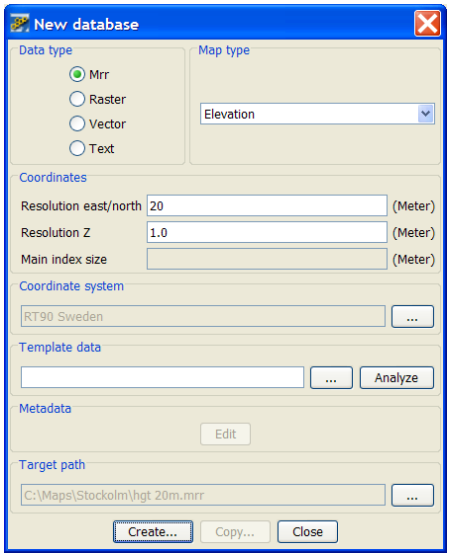
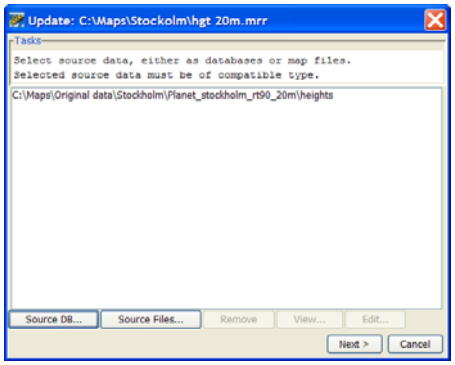
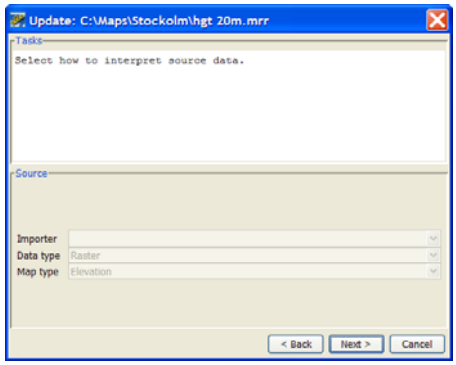
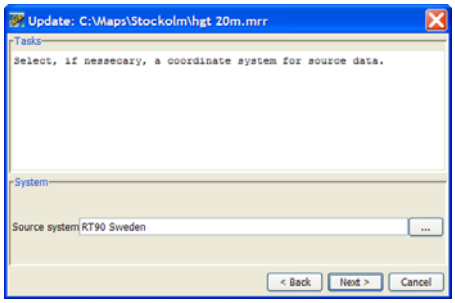


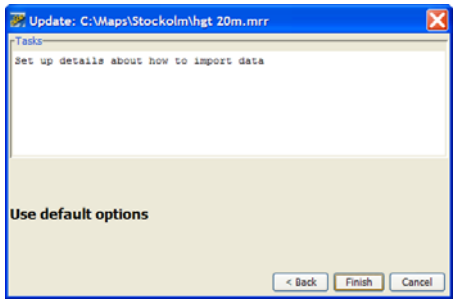
3. Click **Create** to create the elevation database.
4. Click **Source DB** and select the Planet height database to import. Click **Next**. Raster and Elevation should have been filled in automatically so just continue the wizard.





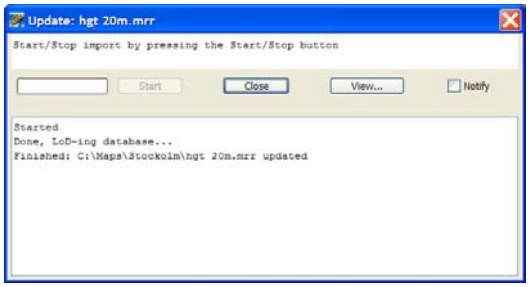
5. Select the Source coordinate system for your original data (if needed). Click **Next** and **Finish**.





6. Click on the **Start** button in the Import launch dialog that has opened. The import is ready when the *Finished* message is visible in

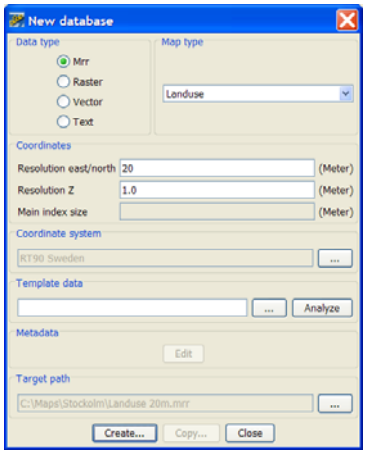
the message panel and the Start / Stop button once again read **Start**.



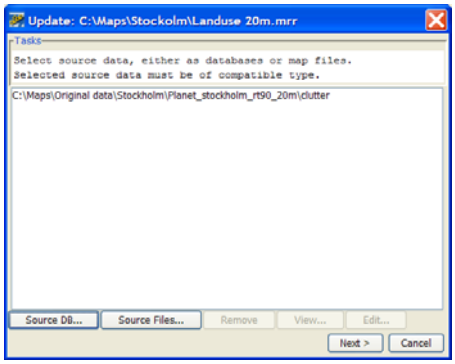
6.1.2 Procedure for a landuse conversion

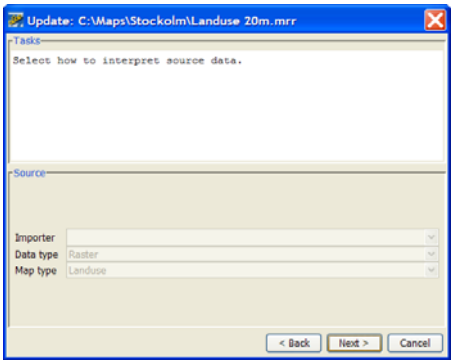
Do as follows to convert landuse data:

1. Select **File -> Map data -> Import wizard** and the **New** alternative to create a new database. Select the Planet landuse (clutter database) as template database. The resolution will then be filled in automatically. The proper map coordinate system may be selected again after selecting the template database.
2. Click **Target path** and give the new landuse database a name.

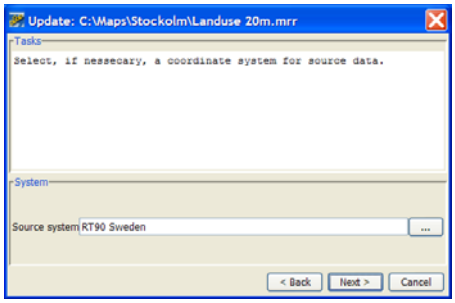


3. Click **Create** to create the landuse database.
4. Click **Source DB** and select the Planet landuse database to import. Click **Next**. Raster and Landuse should have been filled in automatically so just continue the wizard.

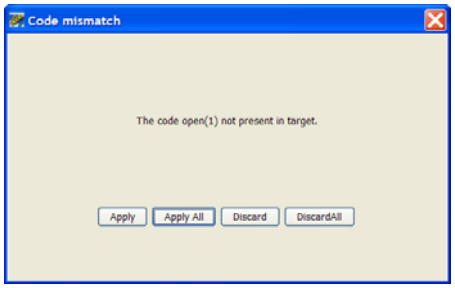


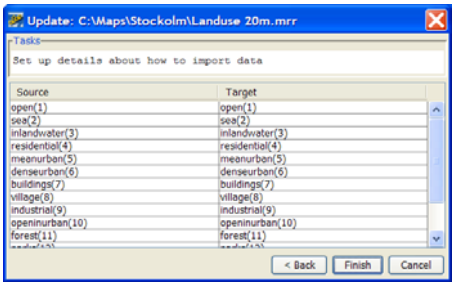


5. Select the Source coordinate system for your original data (if needed). Click **Next**.

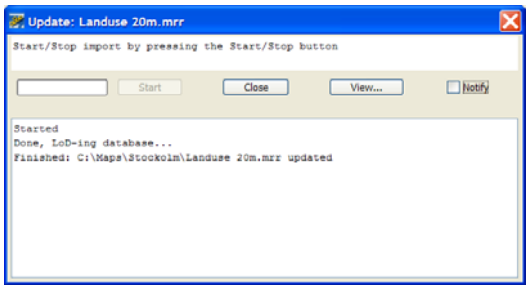


6. Select **Apply all** to update the landuse info file with all the codes from the source. The file may be edited later to change aliases or colors etc.. Click **Finish**.





7. Click on the **Start** button in the Import launch dialog that has opened. The import is ready when the *Finished* message is visible in the message panel and the Start / Stop button once again read **Start**.



6.2 MapInfo MIF/MID format

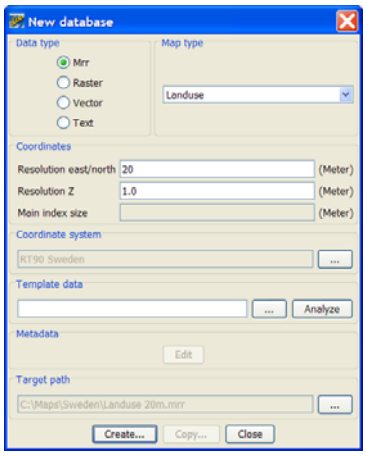
MIF/MID is the import/export format for MapInfo. Before starting the import you should:

- Find out the coordinate system used by the MIF map data. This information can be found in the header of the MIF file. You should check that this coordinate system exists in TEMS CellPlanner, and if not create the new coordinate system according to description in chapter ***Customizing Coordinate Systems***.
- Figure out what resolution to use if the data to convert is raster data (elevation, landuse, obstacle, object area or traffic).

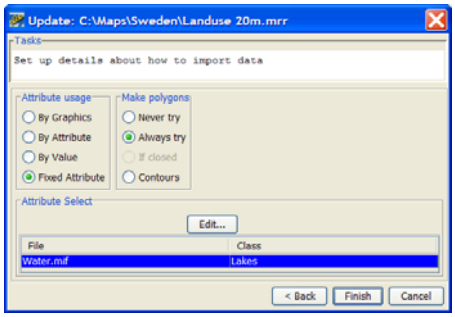
6.2.1 Procedure for a landuse conversion

Note: Some MIF/MID landuse files can be tricky to convert directly to a raster landuse database, in such case a temporary Vector database must be used before importing to the Landuse database.

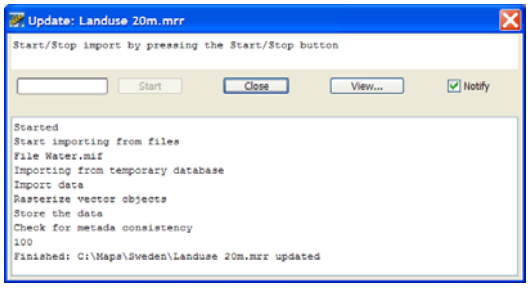
1. Select **File -> Map data -> Import wizard** and the **New** alternative to create a new database.
2. Enter the resolution in m for your data. **Note**: Resolution should be based on the accuracy of the data. Something in-between 5-100 m. It is preferred that the landuse and elevation data that shall be used together has the same resolution
3. Click on **Target path** and give the new landuse database a name.



4. Select **Create** to create the empty database to import your data to.
5. Click on **Source files** and select the ∗.MIF file to import. Click on **Next**. *MapInfo_Default*, *Vector* and *Vector* should have been filled in automatically so just continue the wizard.
6. Select the **Source system** for your original data (∗.MIF). Click on **Next**.
7. Select *Attribute Usage*: **Fixed Attribute** and click on **Edit** to add landuse codes if the lucinfo.ini file is empty. The new codes must be **Saved**. Click in the Class column and select the proper code if the codes are already in the landuse info file (easiest). Click **Finish**.



8. Click on the **Start** button in the Import launch dialog that has opened. The import is ready when the *Finished* message is visible in the message panel and the Start / Stop button once again read **Start**.



6.3 SRTM format

The Shuttle Radar Topography Mission (SRTM) "∗.bil" (USGS) format is free of charge and can be downloaded via the Seamless Data Distribution System at the web page:
http://seamless.usgs.gov (Please be aware of that web links can be changed).

Other SRTM formats are available on different web pages like "∗.HGT" and "∗.ADF" format, those formats are not supported in this version of the TEMS CellPlanner Import Wizard.

Only elevation data is supported. See chapter ***About Geodata - Geodata*** – ***Source data*** – ***SRTM Elevation Data*** in the ***TEMS CellPlanner GeoData User's Guide*** for more details of the SRTM format.

Before starting the import you should make sure the following files are available:

- xxx.BIL - The raw data file
- xxx.HDR - Describing the raster structure
- xxx.BLW - Registration file, similar to TFW (see chapter ***Image files*** below).

6.3.1 Procedure for an elevation conversion

Do as follows to convert elevation data:

1. Select **File -> Map data -> Import wizard** and the **New** alternative to create a new database
2. Enter 90 m as *Resolution east/north* if "*3 arc sec*" data is used and 30 m if "*1 arc sec*" is used.
3. Select a coordinate system. The original data is always in Geographical/WGS84 coordinates and should be projected to the projection used by other map data in the current project. You can choose any coordinate system. If you do not have any other map data for the area, the suggestion is to use the UTM projection and WGS84 datum. Select the proper UTM zone, corresponding to the area for your downloaded map, by clicking in the world map. Click **OK** to close the Map coordinate system selection dialog.
4. Click on **Target path** and give the new elevation database a name.
5. Select **Create** to create the empty database to import your data to.
6. Click on **Source files** and select the ∗.BIL file to import. Click on **Next**.
7. *SRTMBIL*, *Raster* and *Elevation* should have been filled in automatically so just continue the wizard.

8. Source system is WGS 84 Geographic (which should have been filled in automatically). Click on **Next** and **Finish**.
9. Click on the **Start** button in the Import launch dialog that has opened. The import is ready when the *Finished* message is visible in the message panel and the Start / Stop button once again read **Start**.

6.4 ArcInfo ASCII Grid / Grid Ungenerate format

The format is described in the ***Map data format descriptions*** chapter.

Before starting the import you should:

- Make sure that the file has the extension ∗.GRD. If the file follows the ASCII grid specification but has another extension, just change the extension manually before importing the data.
- Find out the coordinate system used for your ASCII grid map data. This information can not be found in the ∗.GRD file.
- Find out the resolution by opening the ∗.GRD file and read the `CELLSIZE` parameter that states the resolution in m.

6.4.1 Procedure for an elevation conversion

Do as follows to convert elevation data:

1. Select **File -> Map data -> Import wizard** and the **New** alternative to create a new database.
2. Enter the resolution in m for your data. **Note**: Resolution should be based on the accuracy of the data, something in-between 5-100 m. It is preferred that the landuse and elevation data that shall be used together has the same resolution ‘
3. Select a coordinate system. You should select the same projection that is used by other map data in the current project.
4. Click on **Target path** and give the new elevation database a name.
5. Select **Create** to create the empty database to import your data to.
6. Click on **Source files** and select the ∗.GRD file to import. Click on **Next**.
7. *GridImport*, *Raster* and *Elevation* should have been filled in automatically so just continue the wizard.
8. Select the **Source system** for your original data (∗.GRD). Click on **Next** and **Finish**.
9. Click on the **Start** button in the Import launch dialog that has opened. The import is ready when the *Finished* message is visible in the message panel and the Start / Stop button once again read **Start**.

6.5 ArcInfo Shape format

Shape is a binary format for vector data and supports a variety of shape types. The following table shows the types that are supported by the Import Wizard:

Shape type	Shape tag number
Point	1
PolyLine	3
Polygon	5
MultiPoint	8
PolyLineZ	13
PolygonZ	15

To be able to extract attribute information such as elevation, an associated DBF file must be supplied. Utilizing the elevation information from PolygonZ or PolyLineZ is not implemented!

6.5.1 Procedure for a vector conversion

Do as follows to convert vector data:

1. Select **File -> Map data -> Import wizard** and the **New** alternative to create a new database.
2. Enter the Main index size in m for your target data. The Main index size defines the length of one side of each tile stored in the map database, for vector data this parameter should be set to a value that will store between 1000 and 10.000 objects in each tile.
3. Select a coordinate system. You should select the same projection that is used by other map data in the current project.
4. Click on **Target path** and give the new elevation database a name.
5. Select **Create** to create the empty database to import your data to.
6. Click on **Source files** and select the ∗.SHP file to import. Click **Next**.
7. *SHP*, *Vector* and *Vector* should have been filled in automatically so just continue the wizard.
8. Select the **Source system** for your original data (∗.SHP). Click **Next**.
9. Select *Attribute Usage*: **Fixed Attribute** and click on **Edit** to add vector codes if the vecinfo.ini file is empty. The new codes must be **Saved**. Click in the *Class* column and select the proper code if the codes are already in the vector info file (easiest). Click **Finish**.
10. Click on the **Start** button in the Import launch dialog that has opened. The import is ready when the *Finished* message is visible in

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the message panel and the Start / Stop button once again read **Start**.

6.6 Image files (TIFF, BMP, GIF and JPEG)

The image formats supported are TIFF, BMP, GIF and JPEG.

The TFW file, Tiff World File, is a simple text file containing the registration, affine transform parameters, from image pixels to world coordinates. Some times it's named **B**MW when used with **BMP** etc. If the import does not work, try to rename the xxx.*N*NW file to xxx.TFW

Index files (Planet DMS) are also supported as description files.

TIFF stands for Tagged Image File Format and supports a variety of implementations. As TEMS CellPlanner uses a standard JAVA library for image file access, the current TIFF file can contain tags that are not supported. If the import does not import, try to load the TIFF file into an image processing application such as Paint Shop and export it to another format.

Before starting the import you should:

- Find out the resolution from the description file (∗.TFW; Index etc).

6.6.1 Procedure for an image conversion

Do as follows to convert image data:

1. Select **File -> Map data -> Import wizard** and the **New** alternative to create a new database.
2. Enter the resolution in m for your target data.
3. Select a coordinate system. You should select the same projection that is used by other map data in the current project.
4. Click on **Target path** and give the new image database a name.
5. Select **Create** to create the empty database to import your data to.
6. Click on **Source files** and select the image file to import. Click on **Next**.
7. *Image Import*, *Raster* and *Image* should have been filled in automatically so just continue the wizard.
8. Select the **Source system** for your original data (image file). Click on **Next** and **Finish**.
9. Click on the **Start** button in the Import launch dialog that has opened. The import is ready when the *Finished* message is visible in the message panel and the Start / Stop button once again read **Start**.

7 Image file registration

An image file containing e.g. a satellite image or a scanned map must be accompanied by an ESRI World file that describes the image's location in a map reference system. The ESRI World file contains the parameters for an affine transformation of the image pixels to a world coordinate system. If an image does not have a World file setup, this file can be created using the **Image file registration** window. In this window the selected image can be georeferenced using an existing map database by dragging, rotating and stretching the image until it has an acceptable fit to the reference map.

7.1 ESRI World file

The ESRI World files (also known as TFW files) contain 6 parameters that define an affine transformation of the image to a map coordinate system. The file has the same name as the image file, but with the extension *.tfw* for TIFF files, *.bmw* for bitmap files, *.gfw* for GIF files and so on.

An affine transformation is defined as:

$$\begin{pmatrix} X \\ Y \\ 1 \end{pmatrix} = \begin{pmatrix} M00 & M01 & M02 \\ M10 & M11 & M12 \\ 0 & 0 & 1 \end{pmatrix} * \begin{pmatrix} x \\ y \\ 1 \end{pmatrix}$$

Where:

X = the East coordinate in the map coordinate system
Y = the North coordinate in the map coordinate system
M00 = $Sx * \cos(\alpha)$
M01 = $-Sy * \sin(\alpha+\beta)$
M02 = the East coordinate of the image's upper left corner
M10 = $Sx * \sin(\alpha)$
M11 = $Sy * \cos(\alpha+\beta)$
M12 = the North coordinate of the image's upper left corner
x = the image pixel coordinate along the x-axis
y = the image pixel coordinate along the y-axis

Sx = scale shift along the X-axis
Sy = scale shift along the Y-axis
α = rotation
β = shear

In the ESRI World file the parameters are given in the following order:

M00
M10
M01
M11
M02
M12

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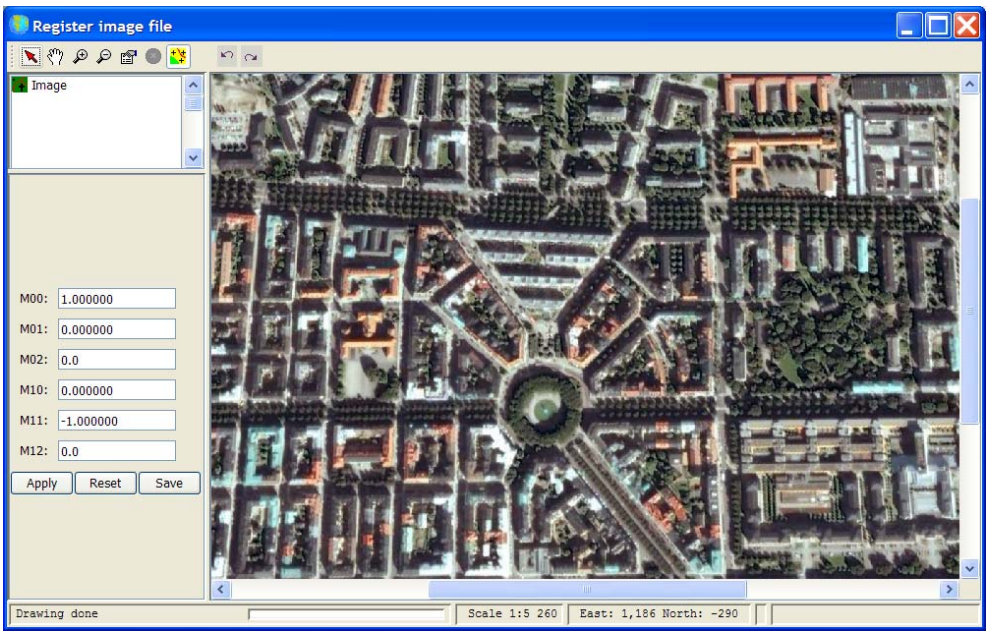
7.2 Window to use to register an image file

Select a source image file in the **Source selection** window and click on **Edit…**. First a **Map coordinate system selection** dialog will be opened where you can select the coordinate system that the image file shall be registered to. Once you have selected the coordinate system click **OK** to open the **Register Image file** window where the selected image and the current affine transformation parameters are displayed.

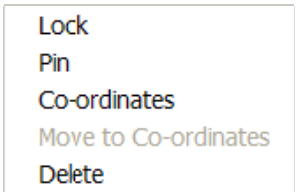


Field	Description
Menu buttons	Buttons for controlling the map view. **Pointer**; neutral mouse pointer. **Pan**; tool for panning the map view. **Zoom in**; tool for zooming in to the map view. **Zoom out**; tool for zooming out of the map view. **Map properties**; opens the **Map display properties** dialog for selecting map layers do display and setting their properties. **Stop**; stops the redrawing of the map window. **Map stretch**; tool for placement of markers to be used in the registration process. The button will also turn on the display of the markers. **Undo**; button for undoing the last transformation change. **Redo**; button for redoing an undone transformation.
Affine parameters	A presentation of the 6 affine parameters, as defined above. The parameters can be edited.
Apply	Applies the current affine parameters to the map view.
Reset	Resets the affine parameters to the original values and updates the map view.

Save	Saves the currently defined affine parameters, a TFW file with the current parameters is automatically created in the folder of the image file.

7.2.1 Map stretch tool

The Map stretch tool is providing the functionality for registering the image graphically, i.e. defining the affine transformation parameters. The tool allows you to place markers in the map view. These markers can be used to drag, rotate, skew and change the scale of the image. Select the Map stretch tool and click in the map view to place a yellow marker. This marker is not locked to any position in the image or the map and can be dragged into another position. By right clicking on a marker the following menu is displayed:



Option	Description
Lock	Toggle on/off a lock of the marker's position with respect to the image. A locked marker is displayed in green. By dragging a locked marker also the image will be dragged, or rotated and stretched if a pinned marker is set, see the **Pin** option below.
Pin	Toggle on/off a lock of the marker's position with respect to both the image and to the coordinate system. A pinned marker can not be dragged and its position will be kept even when a locked marker is dragged. A maximum of two pinned markers can be selected for georeferencing the image. A pinned marker is drawn in red.
Co-ordinates	View and adjust the coordinates of the marker.
Move to co-ordinates	This option is only enabled after the **Co-ordinates** option is selected. This option will move the marker to the coordinates entered
Delete	Delete the marker.

7.3 Registration process

Do as follows to register an image file:

1. Select a source image file in the **Source selection** window and click on **Edit…**.
2. Select the coordinate system that the image file shall be registered to in the **Map coordinate system selection** dialog and click **OK**.
3. In the **Register Image file** window the first step is to roughly position the image in the right area, which is done by entering the approximate East and North coordinates of the top left corner of

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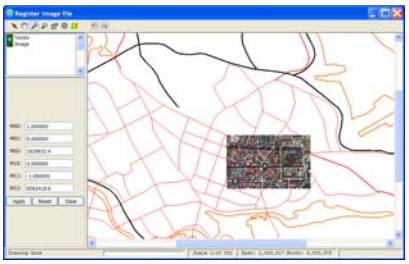
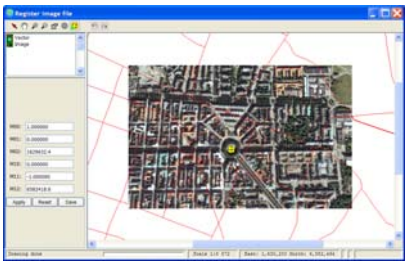
the image. The **M02** parameter corresponds to the East coordinate and the **M12** parameter to the North coordinate. Select **Apply** to update the position in the map view.

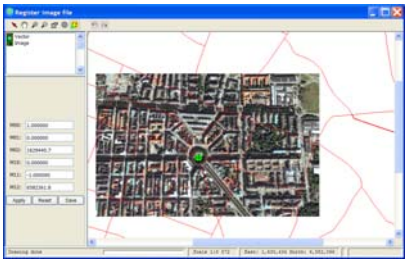
4. When the image is positioned in the right neighborhood you should select an existing map with well defined features that can be recognized in the image, e.g. a vector map, that can be used to geo reference the image. Select the **Map properties** button to open the Map properties dialog and add a reference map.



5. Once the image is roughly located in the right area and a reference map has been selected, the process of registering the image in the selected coordinate system can be done. To drag the image in the map view, select the **Map stretch** tool and click on a well defined feature, e.g. a road crossing, in the image. This will place a yellow marker at this position. The marker can be dragged into correct position if needed.

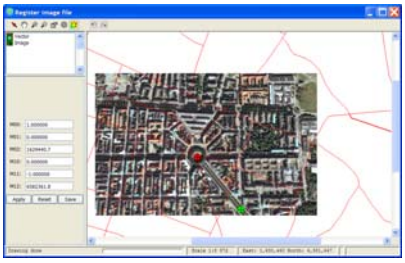


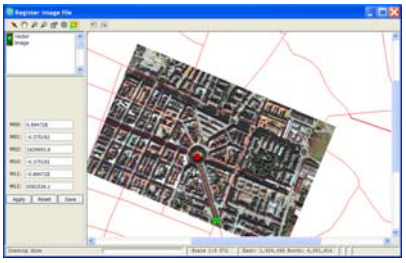
6. Right click on the yellow marker and select the **Lock** option. A locked marker is displayed in green. The locked marker can now be used to drag the image to a new position, e.g. so that the selected road crossing in the image coincides with the corresponding road crossing in the reference map.



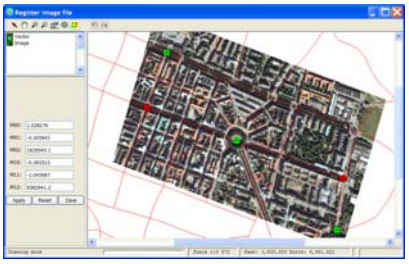
7. To rotate and stretch the image, right click on the previously selected marker and select the **Pin** option. A pinned marker is drawn in red. Continue to click on another well defined feature in the image to place a marker there. Right click the new marker and select **Lock**. Drag this marker so that it coincides with the corresponding feature in the reference map. The pinned location

is kept unaltered while the rest of the image is rotated and stretched. Two markers can be pinned; preferably two well defined features located far from each other in the image.





8. Continue to rotate and stretch the image using different geographic features in the image until an acceptable fit is achieved.



9. Once an acceptable fit is achieved, save the image registration parameters by clicking the **Save** button. A TFW file with the current parameters is automatically created in the folder of the image file. The **Register Image file** window can now be closed.

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